

Georgia Ports Authority Hopes RFID Will Boost Efficiency, Throughput

The Port of Savannah's new system includes 915 MHz active RFID tags, OCR and 125 kHz underground inductive loops to identify and locate trucks and their cargo containers.

April 11, 2007—The Georgia Ports Authority (GPA) is set to begin installing RFID technology at the Port of Savannah, to track shipments being brought in and out of the port. The RFID technology will help increase safety in and around the port and improve the visibility of shipments coming from or going to Wal-Mart, Target and other companies.

The implementation will include Identec Solutions' long-range active 915 MHz RFID tags and interrogators, which use a proprietary air-interface protocol, as well as a new product called the Identec i-Mark, an underground 125 kHz inductive loops to document the position and time a truck enters a lane. The system will also utilize Navis' Edge Manager middleware to collect and manage data culled from RFID and other technologies and pass it along to other Navis applications currently used by the GPA. These applications include SPARCS (a core terminal-planning and control system), Express (a system for managing bookings, billing and other transactions) and WebAccess (a Web-based software portal used by GPA's customers to check container status, as well as book delivery and pickup appointments).

In addition, the project will incorporate optical character-recognition (OCR) software from SAIC. The GPA and its partners have already begun installing the various hardware and software. Mike Dempsey, VP and general manager of Navis' Edge Technology Solutions, expects the project to go live sometime this summer.

The implementation is part of the GPA's ongoing initiative to help its terminal operators collect real-time information on RFID-tagged containers so they can provide their customers—U.S. logistics companies, retailers and product suppliers—greater levels of efficiency, real-time visibility and condition statistics for containerized cargo.

"We are doing this for efficiency's sake," says Bill Sutton, the GPA's general manager of information technology. "Our growth pattern here is significant, and we are trying to find ways to move more cargo. This project is purely about how can we be as efficient as we can, so we can move as much cargo as we can, as efficiently and as cost-effectively as we can."

The GPA has already been testing RFID for several months, albeit on a smaller scale. The agency has worked with the Maritime Logistics Innovation Center (MLIC), a state program designed to facilitate collaboration between private industry, academia—such as the Georgia Institute of Technology—and federal and state agencies (see Georgia Cargo Terminals Becoming RFID-Enabled). That project leverages Savi Networks' SaviTrak, an RFID-enabled global container shipment-tracking service. Savi Networks is a joint venture of RFID systems provider Savi Technology and seaport operator Hutchison Port Holdings (HPH).

Many of Savi Networks' customers are the companies that actually ship goods. To track the containers en route, the companies affix RFID tags including Savi Technology's Savi Tag ST-676 ISO Container Security Tag, a battery-powered (active) 433 MHz RFID tag that clamps onto a cargo container's door. The tag's unique ID number can then be associated with the shipping manifest and other documents in a database hosted by Savi Networks.

The GPA installed Savi readers at the Port of Savannah's three outbound gates, Sutton explains, to track import cargo. "The Savi project is really about notification of the movement of cargo, letting companies know when a container moves through," he says. "If every container had a Savi tag on it, I suppose I wouldn't need to do this project—but the fact is, they don't."

The Navis project at the Port of Savannah involves tracking containers as they enter and move about the terminal. To facilitate this RFID implementation, the GPA is purchasing about 7,500 RFID tags, each encoded with a unique ID number. The tags will be affixed to the cabs of trucks contracted by companies to bring or pick up containers of goods to and from the terminal. Most of the trucks are owned by local logistics providers and, thus, will have permanent RFID tags screwed to their bumpers. The GPA is sending the logistics companies their RFID tags, and the companies will use WebAccess to enter the ID numbers of the tags they receive and associate those numbers with all their truck ID numbers.

A small percentage of the trucks—long-haulers that may only visit the port a few times per year—will receive temporary tags when they come to the port. Those tags, Dempsey says, will be affixed using magnets.

As a truck enters one of three gates, RFID interrogators will scan its tag and pass that information to the Navis Edge Manager, which will communicate with Navis Express to cross-check and confirm the tag's number. The implementation is expected to include about 12 interrogators, positioned throughout the terminal, each with about a 300-foot-radius read range.

The truck will then move into a lane to be processed through three checkpoints. The first will be outfitted with SAIC's OCR portal, which will scan the serial numbers printed on the sides of each truck's container and chassis, and on the generator set (a refrigeration unit on refrigerated containers), then convert an image of the numbers into a digital format a computer can process. Next, the truck will move forward to a scale and be weighed. Finally, at a third checkpoint called the pedestal, employees will visually inspect the truck's container seals to make sure they haven't been cut or broken off, and that the container hasn't been opened.

Each lane at the port will typically have three such position markers, one at each checkpoint, either buried under the ground or positioned next to it, to send position and time data to the tag. As each truck moves through its lane, it will eventually pass an i-Mark position marker, which will transmit a unique bit string identifying that specific marker. That information will be received by the tag, which will periodically forward it, along with the tag's ID number, to the Identec Solutions interrogators. The readers will relay all the RFID tag data to Navis' Edge Manager software, which will also receive the OCR, scale and seal-inspection data from the three checkpoints. All of this information will then be cross-referenced and checked in Navis Express to clear each truck's entrance into the terminal, and to generate instructions regarding each driver's next steps. Navis Express will then

automatically send an electronic file containing those instructions to a computer at the pedestal checkpoint, to be printed out and handed to the driver.

"The GPA is one of the fastest-growing, most successful ports in the America," says Dempsey, adding that the project will help increase the flow of trucks into the gates and into the yard. "As the volumes grow, that's important. Also, from a green standpoint, because trucks won't be idling for long times waiting in lines, there will be less congestion and less fumes."

The GPA is also installing RFID interrogators in cranes and other container-handling equipment at the Port of Savannah, which will scan the tags as operators move containers in the yard.

Most notably, rubber-tired gantries (RTGs)—70-foot-tall cranes used to move the containers around—will have i-Mark position markers mounted onto the sides. When a truck pulls under an RTG to have its container off-loaded, the position markers will communicate with the tags, providing position and time data. The tags will then be scanned by a nearby reader, which will download the information and pass it to Edge Manager, which will send it to SPARC, officially documenting that a specific container is being off-loaded. SPARC will gather that information and create instructions detailing where to put that container.

Those instructions will then be sent to a truck-mounted computer accessible by the RTG operator. In the past, a person on the ground used a radio to inform the operator where to put the containers. What's more, the RTG operator—who is typically 70 to 80 feet up in the air—had to look down onto each container to manually read its ID, printed on top. The new automated processes will add even more benefits to the GPA implementation, Dempsey says, noting, "Once inside the yard, the benefits are really twofold: safety and labor savings."